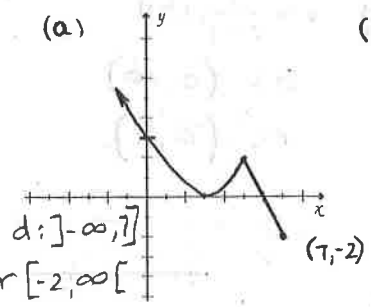
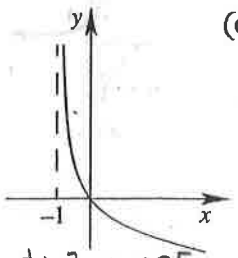
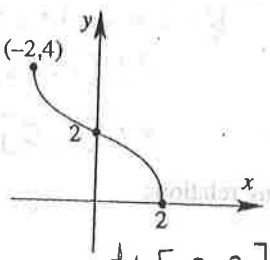
7. State the domain and range of the relations. Which are functions?
Which functions have an inverse function?

(a) 

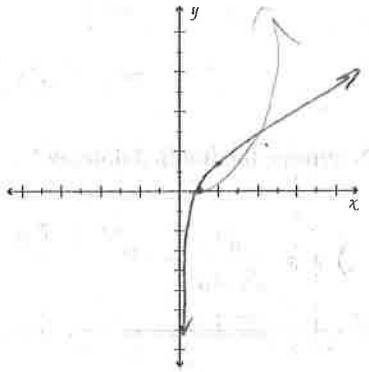
d: $]-\infty,7]$
r $[-2,\infty[$

(b) 

d: $]-1,\infty[$
r: $\mathbb{R}$

(c) 

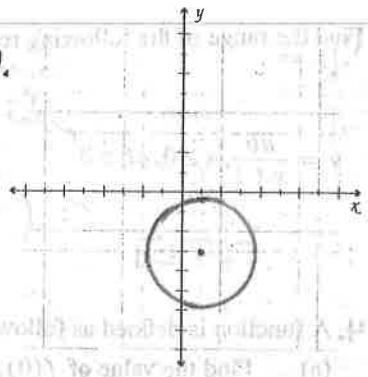
d: $[-2,2]$
r: $[0,4]$

8. 

functions: all 3 pass vertical line test
has an inverse: only b & c. Graph a doesn't pass horizontal line test.

8. Sketch the graph of $f(x) = x - \frac{1}{x}$, $x > 0$. Does the inverse function, f^{-1} exist? domain restriction
Give a reason for your answer.

f^{-1} exists because graph passes horizontal line test.
The inverse will be one-to-one.

9. 

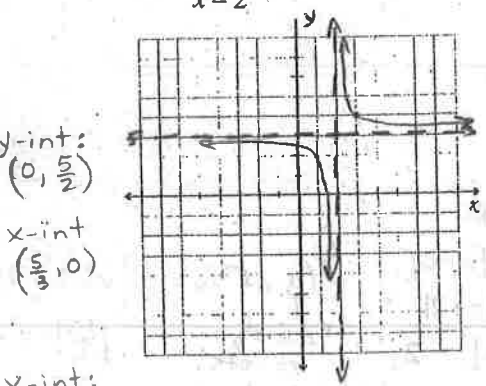
9. Graph. Find the center and the exact radius (simplified).

$x^2 + y^2 - 2x + 6y + 2 = 0$
$x^2 - 2x + 1 + y^2 + 6y + 9 = -2 + 1 + 9$
$(x-1)^2 + (y+3)^2 = 8$
center $(1,-3)$ $r = \sqrt{8} = 2\sqrt{2}$

$r = 2\sqrt{2}$
≈ 2.8

10) Sketch the graph of the following, making sure to include all axial intercepts and labelling the equations of asymptotes (where they exist).

$y = \frac{1}{x-2} + 3$



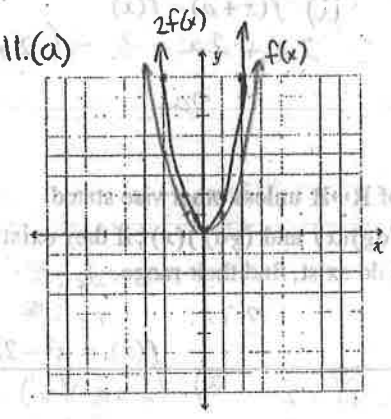
y-int: $(0, \frac{5}{2})$
x-int $(\frac{5}{3}, 0)$

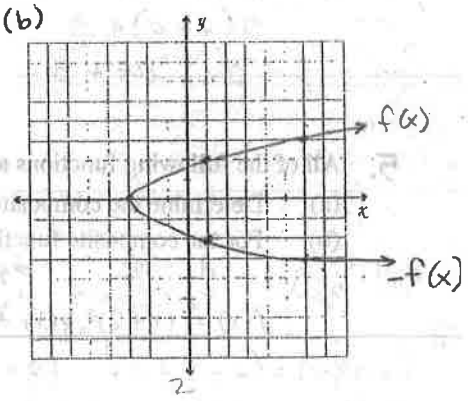
x-int:
$(x-2)(-3) = \frac{1}{x-2}(x-2)$ $x=2$
$-3x+6 = 1 \longrightarrow 3x = 5 \longrightarrow x = \frac{5}{3}$

11. On the same set of axes sketch the graphs of

(a) $f(x) = x^2$, $y = 2f(x)$ y values times 2

(b) $f(x) = \sqrt{x+3}$, $y = -f(x)$ y values $\mapsto (-y)$ (reflect over x-axis)

11.(a) 

(b) 

12. At a local screening of a movie, 450 people are seated in rows such that every row contains an equal number of people. However, if there were three more people in each row the number of rows needed would be reduced by 5. How many rows are there?

x = # of people in each row $(x+3)$
r = # of rows $(r-5)$

$xr = 450 \longrightarrow x = \frac{450}{r}$
$(x+3)(r-5) = 450$
$xr - 5x + 3r - 15 = 450$
$(\frac{450}{r})r - 5(\frac{450}{r}) + 3r - 15 = 450$
-450 -450

$\left(-\frac{2250}{r} + 3r = 15\right)r$
$(-2250 + 3r^2 = 15r)/3$
$r^2 - 5r - 750 = 0$
$(r+25)(r-30) = 0$
$r = 30$ rows